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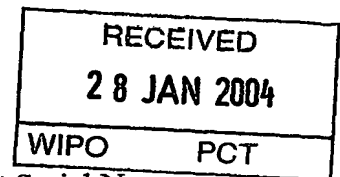
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Specification and Drawings, as originally filed, with Application for Patent Serial No:  
2,414,059, on December 12, 2002, by PANO YIOTIS PATRIKAKIS, for "Retractable Blind  
Spot Mirror".

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(CIPQ 68)  
04-09-02

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ABSTRACT OF THE DISCLOSURE

A retractable blind spot mirror for use with a typical vehicle side mirror mounted in a housing adapted to be attached to the side of a vehicle said housing having a generally rectangular rearwardly open box configuration with a first end adapted for attachment to the vehicle, a remote end, top, bottom and front walls wherein the vehicle side mirror is mounted in the rear opening of housing, said retractable blind spot mirror comprising a right angle prism pivotally mounted adjacent the remote end of said housing wherein said prism is connected to a mirror plate which rotates from an open position such that when the prism is in the closed position, a shutter activates to cover the opening in said housing through which the prism and mirror plate move from the open to closed position and vice versa.

TITLE: RETRACTABLE BLIND SPOT MIRROR

FIELD OF THE INVENTION

5 The present invention relates to an automobile (car,  
truck, van, etc) mirror. In particular this present  
invention provides a mirror design that has the  
capability to the permit a driver to clearly see and  
check the angle of view referred to as the blind spot on  
10 the sides of the automobile.

BACKGROUND OF THE INVENTION

There are many designs of mirrors that are used by all  
15 sorts of automobiles. All of these mirrors do not provide  
a comprehensive and totally safe solution to the blind  
spots on either side of the automobile. There are small  
convex mirrors that are attached on the regular  
automobile mirrors that show the blind spots but with a  
20 serious shortcoming. On these convex mirrors an object  
that one sees is closer than it appears. This fact alone  
makes these mirrors dangerous in the sense that if a  
driver miscalculates when he/she changes lanes, she/he  
may cause an accident.

25 There is a need for a device that overcomes the problem  
just described and shows objects at real distances. In  
other words objects are shown realistically, and are as  
far or as close as they appear.

30 United States Patent 5,245,479 relates to an automotive,  
side, rear view mirror accessory in the form of a prism  
configured to be adhesively attached to the standard  
automotive, side, rear view mirror, providing the user  
35 through refracted light with a wider scope of vision  
with regard to the reflected image in the rear view  
mirror. The prism's positioning, size, and angle of  
refraction can be configured in varying degrees

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in order to provide the user with maximum efficient viewing of any "blind spot" which might exist at any particular angle with regard to the normal angle of view. The prism unit may be adhesively mounted to a standard automotive side rear view mirror utilizing "off-the-shelf," transparent cement, or, alternately, the unit may be a one-piece construction wherein the prism and mirror are molded as one, or the prism itself may have a backing of reflective material, thereby dispensing with the necessity of transparent cement. The prism is located at the outer edge, namely, on the outer, left edge for the driver's side, rear view mirror and on the outer, right edge of the side, rear view mirror on the passenger's side. The prism mirror in this reference is adhesively attached at the end of the conventional mirror which means it cannot be adjusted independently to accommodate the sitting position of the driver. In addition based on the drawings, the viewing angle would be impeded by the edge of the outer shell of the conventional mirror.

United States Patent 5,594,594 describes a triangular prism mirror mounted adjacent a driver of a vehicle to enable the driver to view the blind spot area without any distortion of vision. The triangular prism mirror unit has three plane surfaces, the rear surface being blocked. By blocking the rear surface of the prism, the image entering one of the front surfaces will appear on the other front surface. Therefore the triangular prism mirror, when properly mounted, provides a clear vision for the driver of a vehicle giving access to the blind spot area. Using this design, when viewing the prism mirror the driver in his peripheral vision sees other objects/items around the prism mirror and this can be confusing if one is to consider that this process is supposed to happen in split second timing. By having the prism mirror situated above the conventional one it looks

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awkward and bulky and not at all eye-pleasing and definitely looks like a foreign body. The blind spot mirror obstructs part of the view of the driver which is just above the conventional mirror and that means the driver cannot check far ahead distances.

U.S. Patent Re. 30,673 discloses a composite mirror assembly adapted to be mounted adjacent the driver of a vehicle to enable the driver to view objects, as other vehicles, within an area normally hidden from view by conventional vehicle mirrors. An additional mirror is positioned at an angle with respect to the conventional side mirror. The angle selected is between six to ten degrees with respect to the surface of the side mirror. In this manner, the additional mirror as positioned enables the driver of the vehicle to view objects within said area, which objects would normally be hidden from view by conventional and existing apparatus. Fig 2 of this patent shows a prism attached on the conventional mirror. The two adjacent sides of the mirror prism are unequal. The incident angle (what the eye is looking at) is much smaller than the viewing angle. This does not help the driver because what and how much area of the blind spot the driver sees has to be equal of the viewing area of the blind spot if items are to remain undistorted. In addition, the prism mirror is attached (affixed) to the conventional mirror, that means that if the conventional mirror is not set properly you can't really see clearly the blind spot. This mirror prism is not independently adjusted to accommodate the driver. Further more because of the way the blind spot mirror is placed on the conventional mirror, it is not protected from surrounding shadows, reflections and of the elements (rain, snow) at all times. In other words there are elements that do not inspire confidence of seeing clearly the blind spot at all times.

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SUMMARY OF THE INVENTION

5 An object of the present invention is to provide a mirror that can show a driver the blind spot on the side of the automobile.

A further object of the present invention is to provide a mirror design that will permit a driver to view both mirrors in a normal manner thus concentrating on driving.

10 Another object of the present invention is to provide a mirror that has a retractable component.

15 Another object of the present invention is to provide a mirror that shows objects as they appear at real distances.

The present invention is based on the concept of a right angle prism. That is the triangular sides of the prism have two equal angles of 45° degrees and one angle of 90° degrees. The light enters one adjacent side, hits the hypotenuse and is reflected out thru the other side perpendicularly (at 90° degrees). This means when you look through one side you can see objects 90° degrees to the left or right or up or down depending how you have positioned the mirror. This prism, which can be as long as it needs to be depending on its application, is then housed at the left end of the regular mirror that is especially designed to house it. Thus when the automobile is stopped and turned off the prism mirror is retracted into its housing and when the automobile is turned on the shutter door of the housing is opened and the prism is moved to a position is where the driver can see the area previously known as the "blind spot" area.

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This in accordance with the present invention there is provided a retractable blind spot mirror for use with a

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typical vehicle side mirror mounted in a housing adapted to be attached to the side of a vehicle said housing having a generally rectangular rearwardly open box configuration with a first end adapted for attachment to the vehicle, a remote end, top, bottom and front walls wherein the vehicle side mirror is mounted in the rear opening of housing, said retractable blind spot mirror comprising a right angle prism pivotally mounted adjacent the remote end of said housing wherein said prism is connected to a mirror plate which rotates from an open position such that when the prism is in the closed position, a shutter activates to cover the opening in said housing through which the prism and mirror plate move from the open to closed position and vice versa.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are shown in the drawings, wherein:

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Figure 1 is a perspective view of an automobile mirror equipped with one embodiment of the retractable blind spot mirror of the present invention.

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Figure 2 is a perspective view of the automobile mirror of Figure 1 with the blind spot mirror of the present invention retracted.

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Figure 3 is a top plan view in cross section of the automobile mirror of Figure 1.

Figure 4 is a perspective view of a plate to hold the prism for the retractable blind spot mirror of Figure 1.

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Figure 5 is a perspective view of a shutter for the retractable blind spot mirror of Figure 1.

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Figure 6 is a perspective view of a prism for the retractable blind spot mirror of Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 With reference to Figures 1 and 2, a typical automobile side mirror is generally indicated at 1. The side mirror 1 has a planar mirror 2 mounted in a housing 3 adapted to be attached to the side of a vehicle. In the embodiment  
10 shown, the housing 3 has a rectangular rearwardly open box configuration with a first end 4 adapted for attachment to the vehicle and a remote end 5. The housing 3 has a top 6, bottom 7 and front wall 8. The mirror 2 is mounted in the rear opening 9 of housing 3. A right angle  
15 prism 10 is pivotally mounted adjacent the remote end 5 of housing 3. The prism 10 is connected to a mirror plate 11 which rotates on axis 12 from an open position as shown in Figures 1 and 2 to a closed position as shown in  
20 Figure 3. When the prism 10 is in the closed position, shutter 13 activates to cover the opening 14 in housing 3 through which the prism 10 and mirror plate 11 move from the open to closed position and vice versa. Similarly before the prism can move from the closed to the open position shutter 13 retracts into housing 3.

25 The housing 3 must be sized to accommodate the prism 10 and mirror plate 11 when they are fully retracted within the housing. Shutter 13 preferably moves along a track attached to the inside surfaces 15, 16 of the top 6 and  
30 bottom 7 adjacent the remote end 5 to allow shutter 13 to travel when it is retracted to an open and closed position.

As shown in Figure 4, the mirror-plate 11 has a vertical  
35 base 17 and top 18 and bottom 19 plate sections. The prism 10 is mounted with its hypotenuse side 20 against base 17. There are alternative ways of attaching the prism-mirror to the mirror-plate. The back of the



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vertical base 17 is preferably shaped in a round manner to fit the path of the radius of the mirror plate and prism when it is in motion. This design of the back of the vertical base helps reduce the wind resistance when the automobile is in motion and in addition shows the retractable mirror being a part or a natural extension of the housing of the whole mirror. The mirror plate 11 is mounted to permit rotation about axis 12. The shutter 13 and the mirror-plate 11 (carrying the prism 10) preferably are moved by electric power activated by a switch in the vehicle. Moreover the mirror plate that carries the right angle prism mirror can be adjusted by an electrical switch from inside the car in such a manner that the blind spot is viewed unimpeded and in sync with the sitting position of the driver. This adjustment can be done independently for both mirrors on either side of the automobile.

The major advantage of the design of this invention is that it eliminates the blind spot on both sides of any automobile. Traditionally due to the manner that mirrors were designed and installed on automobiles the driver's view was impeded by not having a comprehensive view on either side of the vehicle. Present mirrors on automobiles, do not provide total coverage of the viewing area on both sides of the automobile. For the right side blind spot the driver has to turn his head to his right to an angle of around 120 degrees in order to check the blind spot. For the left side blind spot the driver has to turn his head to at least 90 degrees in order to check the blind spot. The driver must do these two head movements in sequence and in split second timing in order to ensure his safety and the traffic on his sides before proceeding in changing lanes in a highway.

With this present invention the blind spots on either side are eliminated and the driver does not have to keep

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moving his head left and right in order to ensure clearance of space on either side before proceeding in changing lanes.

- 5 The mirror of this invention is made up of a right angle prism. The viewing side of this mirror prism is perpendicular to the other side of the mirror prism which is directed towards the blind spot. This means that what the driver is viewing is the area 90 degrees to the  
10 left of the left side or 90 degrees to the right of the right side.

- Moreover the driver when looking at the prism mirror is seeing the items/ objects in it at real dimensions. That  
15 is what he/she is looking at is as far or as near as it appears. This is mentioned because many drivers install small convex mirrors on the outer mirrors (left & right) in order to get a glimpse of the blind spot area. The items/objects appearing in a convex mirror are closer  
20 than they appear. This definitely constitutes a danger factor for the driver when he's to change lanes.

- Thus the driver will only look at either mirror, left and right in a normal manner and will be able to view the  
25 blind spot on either side of the vehicle/ automobile.

Another advantage of this present invention is the fact that it is retractable.

- 30 This means that the retractable mirror will move inside its housing which is the end part of the mirror housing frame and the shutter blind activated, once the automobile has stopped and turned off. The process is reversed of course once the automobile is started on, the  
35 shutter blind opens and the mirror prism is moved to the position where it can provide a view of the blind spot to the driver. This motion is done automatically for both

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left and right mirrors of the automobile. The driver will have the option of adjusting slightly though the positioning of the mirror prism towards pointing to the blind spot area.

5

This retract ability of the prism mirror will make the automobile mirror as a whole more compact and thus protected from elements and vandals.

- 10 Although various preferred embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended
- 15 claims.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A retractable blind spot mirror for use with a  
5 typical vehicle side mirror mounted in a housing adapted to be attached to the side of a vehicle said housing having a generally rectangular rearwardly open box configuration with a first end adapted for attachment to the vehicle, a remote end, top, bottom and front walls  
10 wherein the vehicle side mirror is mounted in the rear opening of housing, said retractable blind spot mirror comprising a right angle prism pivotally mounted adjacent the remote end of said housing wherein said prism is connected to a mirror plate which rotates from an open  
15 position such that when the prism is in the closed position, a shutter activates to cover the opening in said housing through which the prism and mirror plate. move from the open to closed position and vice versa.
- 20 2. A retractable blind spot mirror according to claim 1 wherein before the prism can move from the closed to the open position the shutter retracts into said housing.
- 25 3. A retractable blind spot mirror according to claim 2 wherein said shutter moves along a track attached to the inside surfaces of the top and bottom of said housing adjacent the remote end to allow shutter to travel when it is retracted to an open and closed  
30 position.
4. A retractable blind spot mirror according to claim 1 wherein the mirror-plate has a vertical base and top and bottom plate sections to permit said prism to be  
35 mounted with its hypotenuse side against said vertical base.

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A retractable blind spot mirror according to claim 4 wherein the back of the vertical base is shaped to fit the path of the radius of the mirror plate and prism when it is in motion to help reduce the wind resistance when  
5 the automobile is in motion.

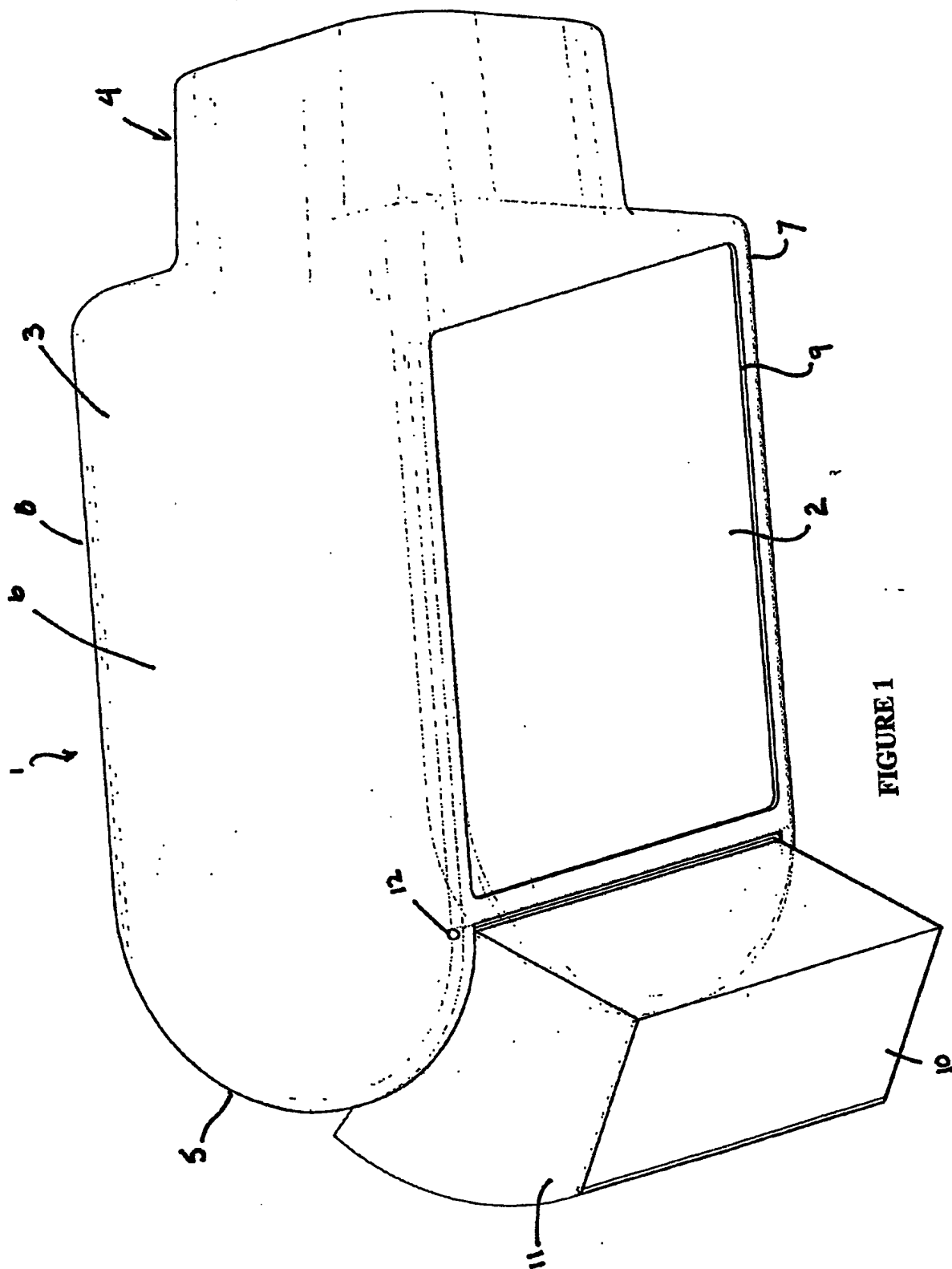


FIGURE 1

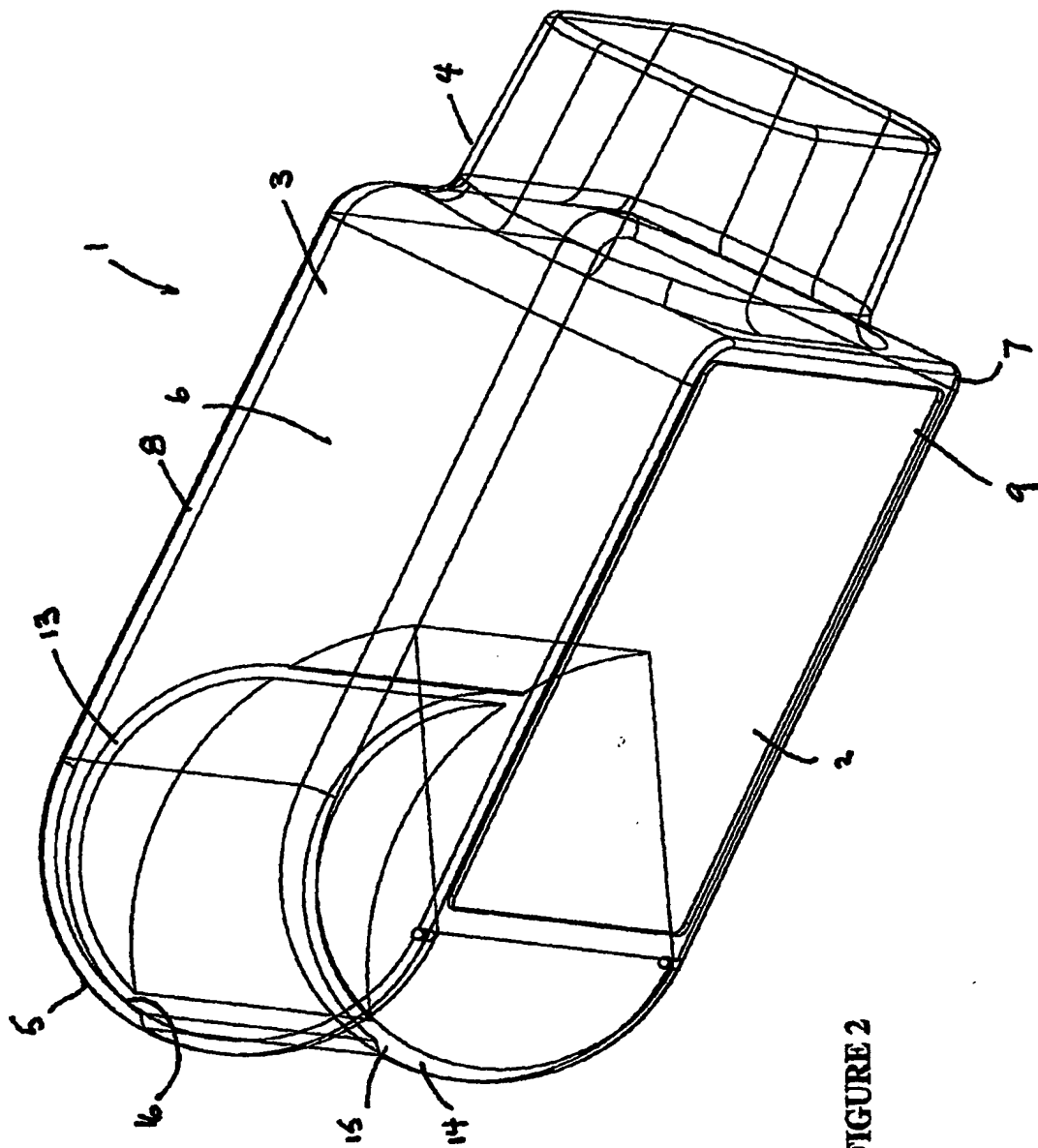


FIGURE 2

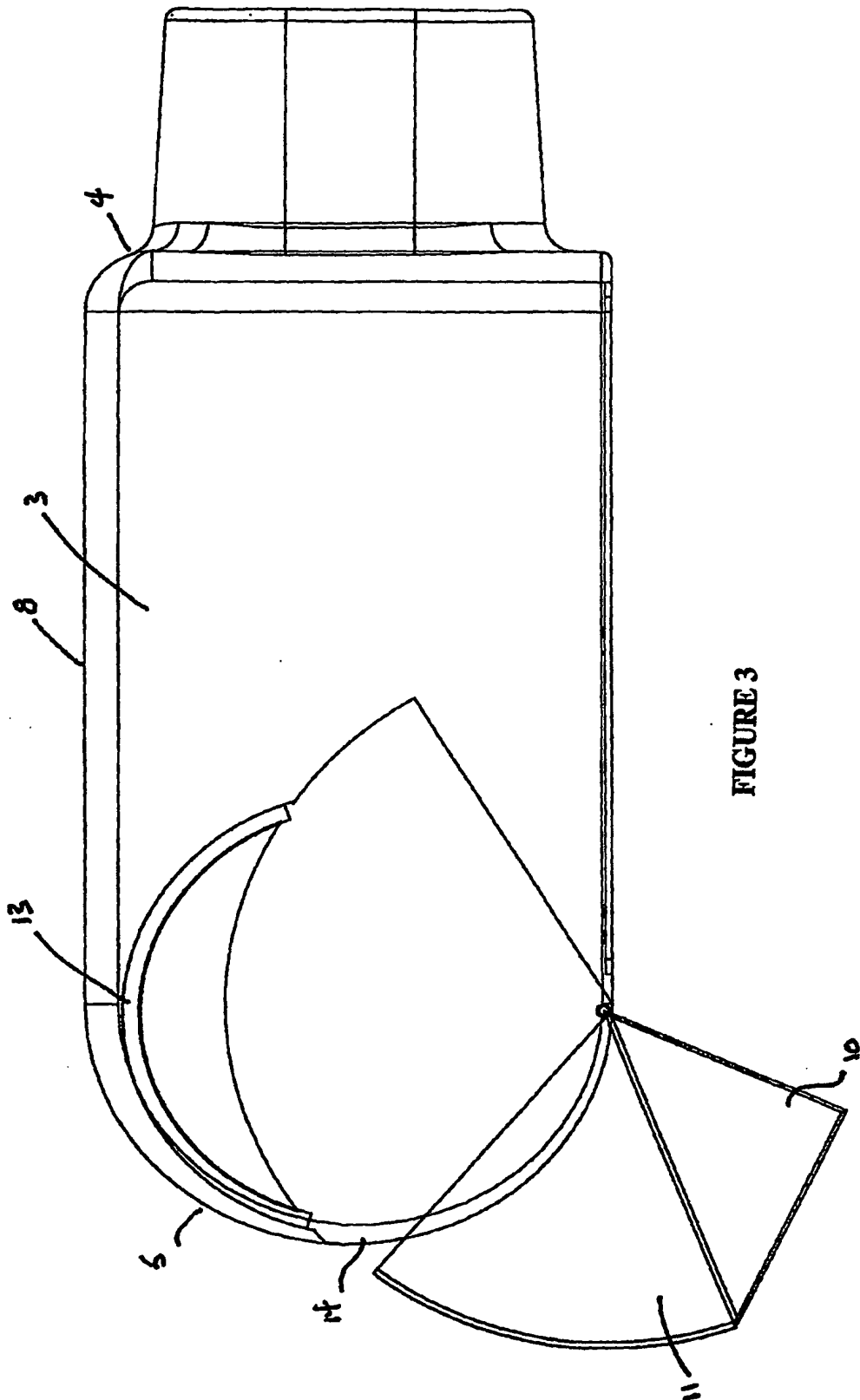


FIGURE 3



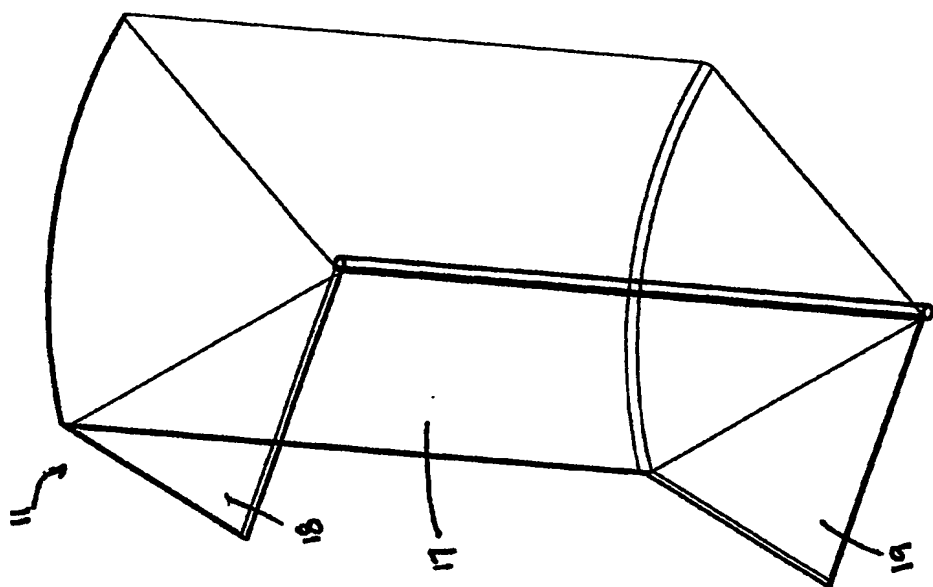


FIGURE 4